



Effect of Compactive Efforts on Strength of Laterites Stabilized with Sawdust Ash

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Received 16 April 2019; Accepted 12 September 2019

Abstract

This study investigates the effects of different compactive efforts on the strength of laterites stabilized with sawdust ash (SDA). Laterites in the categories of A-7-5 and A-7-6 were considered because they are not suitable in the natural states as subgrade materials. The geotechnical properties of the laterites in their natural states were determined. The sawdust was burnt and sieved through 600micron. The sawdust ash (at 2%, 4%, 6%, 8% and 10%) was added to the laterites and the atterberg limits were determined, while the California bearing ratio and Unconfined compression test were determined using three compactive efforts (596, 1192 and 2682KN-m/m³). It was generally observed that the maximum dry densities of the natural and stabilised laterites increase with increase in the compactive efforts, while the optimum moisture contents reduce. The plasticity indices of the laterites increased with the addition of SDA. The optimum values of the MDDs (2006 and 1878 kg/m³) were observed at 4% and 6% SDA of 2682 kN-m/m³ compactive effort for samples A and B, respectively. The soaked and unsoaked CBR values of the soils at natural state are 4.89 and 16.33%, and 3.4 and 5.62% for samples A and B, respectively. The results indicate that the higher the compactive efforts, the higher the CBR values of the two samples. Increase in SDA contents of soil samples A and B showed a non-predictable trend on their CBR values. The Unconfined Compressive Strength values at natural and treated states fell below the requirements. Generally, it was found that the use of sawdust ash alone as stabilizer was not effective. Therefore, it was concluded that future studies should consider the use of the sawdust ash in combination with cement or lime.

Keywords: Sawdust; Ash; Laterite; Compaction; Effort; Strength; Stabilisation.

1. Introduction

The economy of most nations in the world depends on their road network, since this is one of the major means of movement of freight and passengers. For an improved economy in the parts of the world where their major resource of transportation is through road, it is important that the road network of such nations is properly designed and constructed. Unfortunately, failures of road pavements have been so rampant in nations like Nigeria which had always resulted in the loss of life and properties [1]. Different reasons have been attributed as the causes of the failure. This includes the use of unsuitable materials, poor design, poor workmanship, unfriendly environmental conditions, heavy loadings, etc.

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<http://dx.doi.org/10.28991/cej-2019-03091428>



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